DEVICE TO BE FASTENED TO A SUPPORT WHICH IS PROVIDED WITH A THREADED BOLT

This invention relates to a device to be fastened to a support that is provided with a threaded bolt, with a screw component that can be screwed onto a threaded section of the threaded bolt, and with an abutment area on which the screw component rests in its final position.

Such devices are known in practice and have a screw component in the form of a screw nut that can be screwed onto a threaded section of a threaded bolt until it rests on an abutment area in its final position. With the previously known devices, for example, line supports connected to them can in fact be fastened to threaded bolts, but they have the drawback that tolerances in the positioning of the threaded bolts cannot be compensated for, or only in an extremely limited way, for purposes of automated assembly when an arrangement relative to the support is to be adhered to.

The objective underlying the invention is to describe a device of the type mentioned at the outset with which a definitely set arrangement relative to the support is to be maintained in assembly, even in case of tolerances in the positioning of threaded bolts.

This task is accomplished with a device of the type mentioned at the outset by providing that the screw component has a first engagement structure, that there is a rotatable drive component that has a second engagement structure that is engaged with the first engagement structure, and that the screw component and the drive component are movable radially with respect to one another, at least prior to assuming the final position.

Because the screw component and the drive component are movable radially with respect to one another, and the screw component is likewise turned when turning the drive component with a hand tool, for example, by the interaction of the engagement structures, tolerances in the arrangement of the threaded bolts can be compensated in case of a set arrangement relative to the support.

Other useful refinements of the invention are the object of the subclaims.

A preferred example of embodiment of the invention is described below with reference to the figures. The figures show:

Fig. 1 an example of embodiment of the invention in a perspective exploded view that is integrated in a cable holder and that has a screw component and a drive component mounted in a ring cage,

Fig. 2 the example of embodiment of Fig. 1 in another perspective exploded view,

Fig. 3 the example of embodiment of Fig. 1 and Fig. 2 in a cutaway perspective view enlarged relative to the scale of Fig. 1 and Fig. 2, in the area of the screw component and the drive component, and

Fig. 4 the example of embodiment of Fig. 1 to Fig. 3 in a cross-sectional view in the area of the screw component and the drive component in a final position of the screw component on a threaded bolt.

Fig. 1 in a perspective exploded view shows an embodiment of the invention that is integrated into a cable holder 1. The cable holder 1 in a known manner has a first holder arm 2 and a second holder arm 3, each of which is designed with end cheeks 4 and intermediate cheeks 5 between the end cheeks 4 to hold cables.

In the illustrated example of embodiment of the invention, there is an essentially hollow-cylindrical ring cage 6 that is positioned between the holder arms 2, 3 and is connected to them. A bottom ring 7 is set on one axial end face of the ring cage 6 as an abutment area that extends from a wall 8 of the ring cage 6 radially inward, with a feed-through area 9 remaining open. At the axial end face of the ring cage 6 opposite the bottom ring 7 there is a latch structure 10 made up of catches extending radially inward.

The illustrated embodiment also has a screw component 11 that has an outer ring 12. The outside diameter of the outer ring 12 is smaller than the inside diameter of the ring cage 6, so that the screw component 11 has radial clearance in the ring cage 6. Two opposite internal catches 13 extend from the radially inner face of the outer ring 12. The internal catches 13 have a recess 14 in the form of a circular arc on their sides that face one another, and are made to have a certain elasticity radially. There are also a number of driver lugs 15 of a first engagement structure placed on the outer ring 12, which extend away from the outer ring 12 in the direction of adjustment of the internal catches 13. In the illustrated example of embodiment, the driver lugs 15 are made with outer walls 16 arched outward and rounded off.

Finally, the illustrated example of embodiment has a drive component 17 that is designed with a cover ring 18 circular on the outside. The outside diameter of the cover ring 18 corresponds essentially to the inside diameter of the ring cage 6. Placed on the cover ring 18 are a number of driver projections 19 of a second engagement structure projecting radially beyond the cover ring 18, and a formed section 20 projecting beyond the cover ring 18 in the other axial direction as a tool stud structure. The formed section 20 is attached to engage with a hand tool with which the drive component 17 can be turned.

When the example of embodiment is assembled, the face of the outer ring 12 opposite the driver lugs 15 rests on the bottom ring 7 and is positioned loosely in the ring cage 6, while the cover ring 18 is engaged with the latch structure 10 and is thus fixed both axially and radially.

Fig. 2 shows the example of embodiment of Fig. 1 in another perspective exploded view, viewed from a direction opposite to the view according to Fig. 1. It is especially clear from Fig. 2 that a centering socket for a threaded bolt, not shown in Fig. 2, is provided by adjusting the internal catches 13 in a direction away from the bottom ring 7. It can also be seen in Fig. 2 that the outer walls 21 of the driver projections 19 are arched outward and rounded off.

Fig. 3 in a cutaway perspective view on an enlarged scale compared to Fig. 1 and Fig. 2, shows the example of embodiment of Fig. 1 and Fig. 2 in the area of the screw component 11 and the drive component 17 in radial cross section, in about the central area of the ring cage 6.

Fig. 3 shows that the rounded outer walls 16, 21 of the driver lugs 15 and of the driver projections 19 lead to the same type of contact between the engagement structures and thus to equivalent screwing properties relative to the drive component 17 in the various positions of the screw component 11 even with the radial clearance of the outer ring 12 in the ring cage 6.

Fig. 3 also shows that the internal catches 13 are formed on a receptacle ring 22 that is encircled by the outer ring 12. The internal catches 13 and the receptacle ring 22 are preferably made of a metal that is very resistant to bending and to abrasion, with the receptacle ring 22 being extrusion-coated with a plastic material constituting the other parts of the screw component 11.

Fig. 4 shows a cross-sectional view of the example of embodiment of Fig. 1 to Fig. 3 in the area of the screw component 11 and the drive component 17 in a final position of the screw component 11 on a threaded bolt 23 that has external threads 24 and is connected to a support, not shown in Fig. 4. It can be seen in Fig. 4 that the faces of the driver lugs 15 rest on the cover ring 18 and the faces of the driver projections 19 rest on the outer ring 12, so that the screw component 11 also is mounted in the ring cage 6 essentially with no axial clearance.

It can be seen from Fig. 4 that because of the radial clearance of the screw component 11 relative to the ring cage 6 and because of the engagement of the driver lugs 15 and the driver projections 19 constituting the engagement structures, when the drive component 17 turns, the internal catches 13 slide along the external threads 24 and thus firmly connect the cable holder 1 to the support even with radially displaced arrangement of the longitudinal axes of the screw component 11 and of the drive component 17.

It can also be seen in Fig. 4 that because of the funnel-like position of the internal caches 13 in the direction of insertion of the threaded bolt 23, the screw component 11 is automatically aligned, so that starting from a preassembled position, the cable holder 1 can be plugged into an intermediate assembly position in a first assembly step, with the internal catches 13 elastic in the direction of insertion passing over the threads on the threaded bolt 23, before the fastening in the final assembled position takes place in a second assembly step by turning the drive component 17. The correct completion of the second assembly step can be checked by reaching a given

elevated tightening torque acting against the screwing direction on the internal catches 13, and placing them under a definite prestress; it is assured by the rounded design of the outer walls 16, 21 that no elevated tightening torque occurs before the final position is reached indicating falsely that the second assembly step has been correctly completed.